In The Claims:

1. (Currently Amended) A method of making an optical waveguide, comprising

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

depositing a core material on said first insulating layer to fill ~~filling~~ said opening ~~with a core material~~;

removing excess core material; and

depositing a top cladding layer over the core material.

2. (Previously Presented) A method according to claim 1 wherein said semiconductor layer comprises at least one material selected from the group consisting of silicon, silicon-germanium, gallium arsenide, indium gallium arsenide and indium phosphide.

3. (Previously Presented) A method according to claim 1 wherein said semiconductor layer is silicon.

4. (Previously Presented) A method according to claim 3 wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

5. (Original) A method according to claim 1 wherein excess core material is removed by chemical mechanical polishing.

6. (Currently Amended) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

depositing a silicon oxide layer over a silicon nitride layer on said semiconductor layer;

depositing a masking layer on said silicon oxide layer;

masking and patterning an opening in said masking layer;

etching through the silicon oxide and silicon nitride layers to form a hard mask;

etching an opening in said semiconductor layer to the first insulating layer;

depositing a core material on the first insulating layer to fill ~~filling~~ said opening ~~with a core material~~;

planarizing the core material ~~to remove said silicon oxide layer~~;

removing said silicon oxide layer and ~~etching~~ said silicon nitride layer; and

depositing a top cladding layer having a different refractive index than the core material.

7. (Previously Presented) A method according to claim 6 wherein said semiconductor layer is silicon.

8. (Previously Presented) A method according to claim 6 wherein said substrate further comprises a second insulating layer having the first insulating layer disposed thereon.

9. (Currently Amended) A method according to claim 1 ~~further comprising: wherein~~ said substrate further comprises:

a second insulating layer having the first insulating layer disposed thereon.

10. (Previously Presented) A method according to claim 9, wherein the second insulating layer and the first insulating layer are comprised of the same material.

11. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of glass.

12. (Previously Presented) A method according to claim 9, wherein the second insulating layer is comprised of silicon oxide.

13. (Previously Presented) A method according to claim 1 further comprising:

a bottom cladding layer disposed in the opening and having a refractive index different than the top cladding layer.

14. (Currently Amended) A method according to claim ~~1~~ 13, wherein the bottom cladding layer is comprised of glass.

15. (Previously Presented) A method according to claim 9, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.

16. (Previously Presented) A method according to claim 6 further comprising:

conformally depositing a bottom cladding layer in said opening having a different refractive index than said core material.

17. (Previously Presented) A method according to claim 16, wherein the bottom cladding layer is silicon oxide.

18. (Previously Presented) A method according to claim 16, wherein the step of planarizing further comprises:

removing a portion of the bottom cladding layer.

19. (Previously Presented) A method according to claim 6, wherein the first insulating layer is comprised of at least one of glass or silicon oxide.

20. (Cancelled)

21. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a silicon semiconductor layer disposed on a first insulating layer;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein said first insulating layer and said top cladding layer are of silicon oxide, each layer having a different refractive index.

22. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein the second insulating layer and the first insulating layer are comprised of the same material.

23. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon, wherein the second insulating layer is comprised of glass;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material.

24. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon, wherein the second insulating layer is comprised of silicon oxide;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material.

25. (New) A method of making an optical waveguide, comprising:

providing a substrate comprising a semiconductor layer disposed on a first insulating layer;

second insulating layer having a first insulating layer disposed thereon;

forming an opening through said semiconductor layer to said first insulating layer;

filling said opening with a core material;

removing excess core material; and

depositing a top cladding layer over the core material, wherein the core material forms an optical waveguide cladded by the first insulating layer and the top cladding layer.